SECTION 6
Livestock Management Issues

6.1 IDENTIFYING PROBLEMS

6.1.1 What Was Already Known:

At the beginning of this watershed study, it was already known that small cattle and horse operations are fairly common throughout the watershed and that many of these facilities provide animals with direct access to the creeks as a source of drinking water and relief from the hot and humid Indiana summers (see Figure 6-1)

Figure 6.1. Cattle access to local waterways. Photo courtesy of Morgan County Soil and Water Conservation District

It was also common knowledge that livestock herds, if not managed properly, can have a negative impact on the physical, chemical, and biological conditions of surface water as well as quality of groundwater supplies.

Commonly accepted concerns associated with livestock activities include:

1.) elevated bacteria (*E. Coli*) resulting from direct deposit of manure or runoff from feed lots, pastures, and stream banks.
2.) elevated nutrient loading, primarily nitrogen (N) and phosphorus (P), associated with manure, which can lead to algal blooms and significant reductions in dissolved oxygen levels, which are crucial to aquatic organisms.
3.) reduction in cover, biomass, and the productivity of herbaceous and woody vegetation along stream banks, which exposes bare ground, compacts soil, reduces shading of the stream, and leads to an increase in erosion and sedimentation
4.) elevated nitrate and bacteria levels in groundwater supplies

As is described in detail in Appendix B and summarized for each sampling site location on page B-21, *E. coli* has been identified in elevated concentrations at 6 of the 7 sampling sites, and low dissolved oxygen was also identified at these locations.

Data collection also identified periodic spikes of phosphorus and nitrogen in the northern portions (where there is a greater concentration of agricultural land) of the Sycamore Creek subwatershed and southern portions of Lambs Creek.

The Morgan County Health Department staff, through their water quality monitoring program, had already identified livestock as a likely source of *E. Coli* within the watershed. Their findings, as well as the IDEM's and the Watershed Initiative's, findings are discussed in more detail in Appendix B.

6.1.2 What Was Learned During the Process

Windshield surveys conducted by members of the Land Use Committee in 2002 indicated that the livestock populations, originally thought to be scattered throughout the watershed, are concentrated primarily within the Upper and Lower Lambs Creek subwatersheds and the Sycamore Creek subwatershed.

Through various conversations with farmers at the 2002 Morgan County Fair, several public stakeholder meetings, and most notably, the Agricultural Stakeholder Meeting conducted on February 5, 2003, the following information was also learned:

1.) Local farmers are not completely aware of their options when it comes to conservation practices and available conservation programs.
2.) Local farmers are concerned that increased participation in voluntary conservation programs may potentially lead to more regulation.
3.) Local farmers are receptive and willing to participate in conservation programs but feel that they need more information on the requirements associated with participating in such activities.
4.) Local farmers need the assurance that long-term support for such programs will be available.

6.1.2.1 Water Quality

In order to assess the impact livestock populations have on water quality in the Morgan County White River watershed, the coordination team relied on two primary sources of water quality data:

1.) water quality data collected and analyzed by the IDEM, the primary agency involved in surface water quality monitoring and assessment in the State of Indiana.
2.) water quality data collected by the watershed coordination team throughout the planning phase of this project.

Based upon field observations and the collection and analysis of water quality data, the coordination team concluded that several locations within the Morgan County White River Watershed do not meet Indiana's standards for bacteria (*E. Coli*) and that livestock facilities are a contributing factor to this problem.

6.1.3 Causes or Probable Causes of Impairments and Threats

Livestock, in the beginning of this project, was initially identified as a possible cause of bacterial contamination to the White River watershed. This anticipated conclusion, as mentioned in Section 5, agriculture, including row crop and livestock production, has been identified as one of the major contributors of nonpoint source pollution in rural landscapes around the United States.

In 1997, the National Water Quality Inventory (NWQI), sponsored by the United States Environmental Protection Agency (US EPA), reported that agricultural nonpoint source (NPS) pollution is the leading source of water quality impacts to surveyed rivers and lakes, the third largest source of impairments to surveyed estuaries, and a major contributor to ground water contamination and wetlands degradation.

6.1.4 Sources or Probable Sources of Pollutants or Conditions Causing Water Quality Impairments

Probable NPS pollutants associated with livestock in the White River watershed include nutrients, sediment, and bacteria from poorly managed livestock facilities (See Table 6-1). Such pollutants can migrate from feedlots, stream banks, and streambeds to surface and ground water through processes including surface runoff, erosion, and infiltration. In some cases, nutrients and bacteria are directly deposited to the stream through animal defecation. It is important to note that these sources are not specific to the White River watershed or Morgan County. These issues arise with livestock operations around the nation.

Table 6.1 Nonpoint Source Pollution and Livestock Production

Pollutants	Sources Associated with Livestock
Nutrients	Manure (runoff, leaching, direct deposit)
Bacteria	Manure (runoff, leaching, direct deposit)
Sediment	Pasture and streambank erosion due to over grazing and tromping of soil

6.1.5 Prioritization

Figures 6-2 thru 6-4 identify the known livestock facilities that exist within the project area which are limited to the Lambs Creek and Sycamore Creek watersheds. These locations are based upon field observations made by Watershed Initiative volunteers.

Figure 6.2 Livestock Facilities within the Sycamore Creek Subwatershed

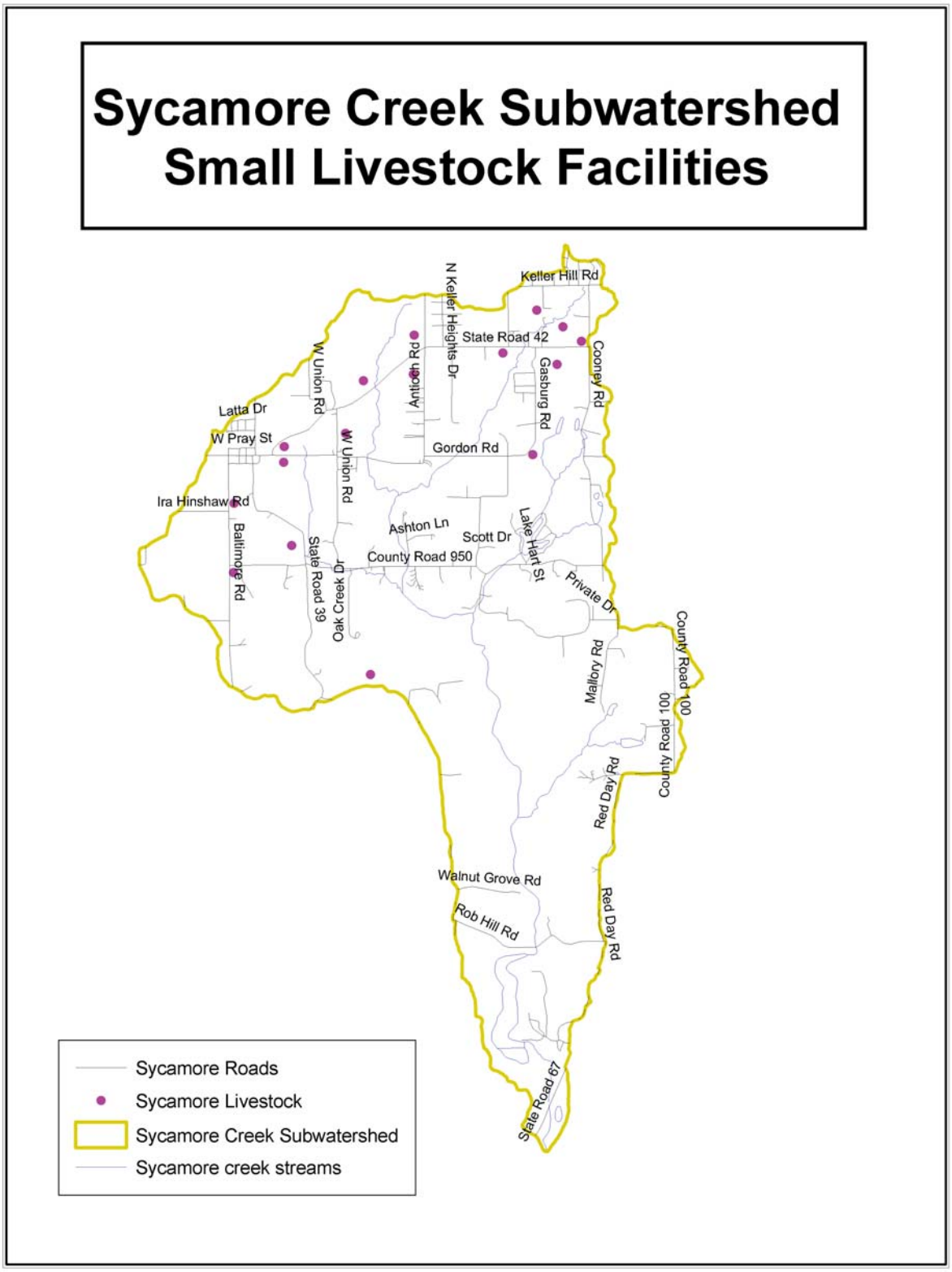


Figure 6.3 Livestock Facilities within the Lambs Creek-Patton Lake Subwatershed

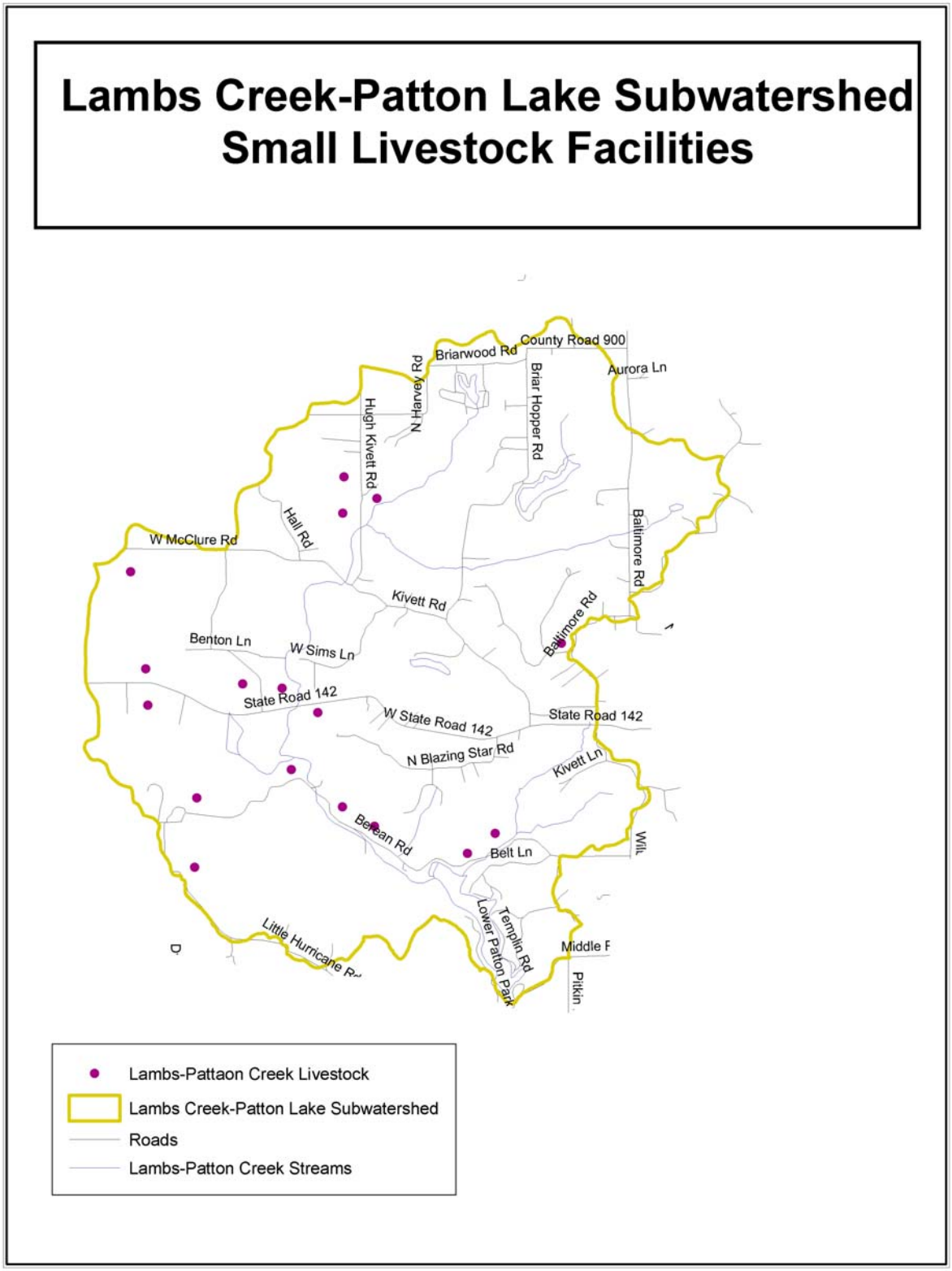
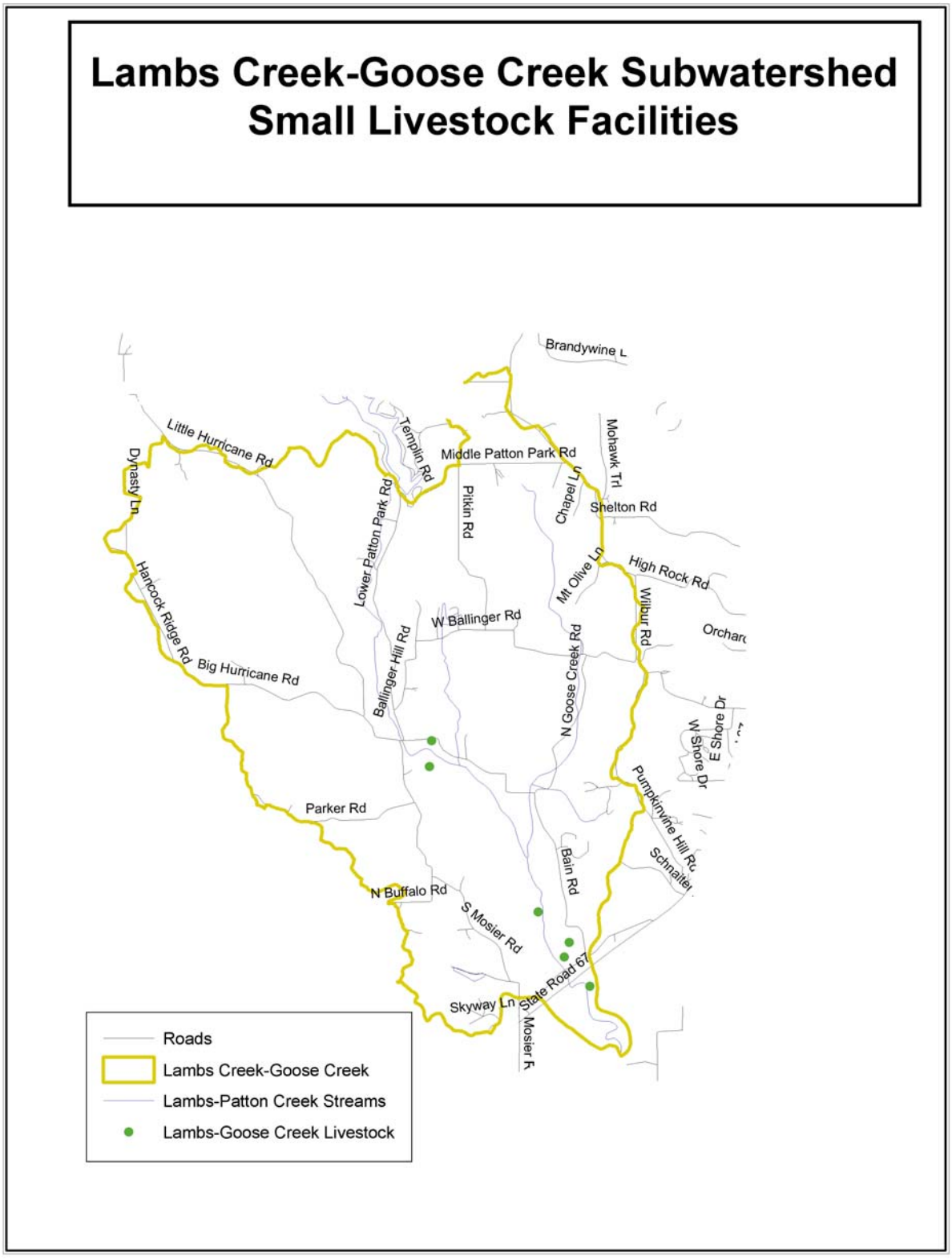


Figure 6.4 Livestock Facilities within the Lambs Creek-Goose Creek Subwatershed



In order to prioritize efforts to address *E. Coli* associated with livestock, it was decided that all of the livestock facilities within the Lambs Creek and Sycamore Creek watersheds should be considered Priority Areas due to the fact that these streams are either on Indiana's 303d list or have been identified as having E. Coli levels that exceed Indiana's water quality standards (see Figure 6-5).

Figure 6.5: Area prioritization table for E coli

Sample Site # on map	Location	Number of *E. coli* exceedances in 12 samples	Number of E coli exceedances during recreational season (April-October)	Is location in a Section 303(d) listed segment of stream and scheduled for TMDL?	Other extenuating factors related to bacteria – detailed in Appendix I	Priority Rank Order for E coli
1	Dry Fork Sycamore Creek at CR 950 North	4	2	No	No	**5**
**2	Sycamore Creek at CR 950 North	6	4	No	No	**4**
3	Sycamore Creek at Robb Hill Road	1	1	No	No	**6**
4	Highland Creek at SR 67	4	2	No	No	**5**
**5	Lambs Creek upstream of Patton Lake at Upper Patton Road	3	1	YES	No	**3**
**6	Lambs Creek downstream of Patton Lake at Lower Patton Road	1	1	YES	YES	**1**
**7	Lambs Creek at Old SR 67	6	5	YES	No	**2**

****Indicates Priority Areas: Sampling Points 2,5,6,7**

6.2 GOALS AND DECISIONS

Primary GOAL #4 of this Watershed Management Plan, as outlined in Section 1 of this document, "to the greatest extent possible and with existing and potential resources, improve and protect water quality in the watershed with the intention, where applicable and appropriate, to achieve and maintain state water quality standards. In order to achieve Primary Goal #4 of this Watershed Management Plan, the following objectives related to livestock issues in the Morgan County White River watershed have been established:

Objective #6-1:
Within the next 6 years, bring E. Coli levels within compliance of state water quality standards in Lambs Creek, both north and south of Patton Lake, and Sycamore Creek south of Hart Lake for 12 months out of the year.

Objective #6-2:
By 2006, attempt interaction with 100% of livestock producers within the watershed to address water quality issues.

Objective #6-3:
Implement a cost-share program to fence cattle from streams, install vegetated buffers between pasturelands and streams, and provide alternative water sources for livestock facilities. The overall goal is to exclude 15% of the livestock from the surface waters of the watershed over the next 5 years.

6.2.2 Management Measures:

Achieving the goals and objectives set by the Watershed Initiative for water quality protection through livestock management practices will involve ongoing and never-ending processes, programs, and actions. In order to achieve the objectives aimed at protecting water quality through livestock management, the Soil and Water Conservation District will implement several interrelated programs.

- Heavily "marketing" best management practices and cost-share programs such as the Conservation Reserve Program (CRP), Environmental Quality Incentive Program (EQIP), IDEM Section 319 cost-share dollars, throughout the watershed but specifically targeted to priority areas identified in the Prioritization section above.
- Provide technical and financial assistance to livestock producers regarding livestock related best management.

6.2.3 Loads or Contributions for the Management Measures

Utilizing the IDEM's Load Reduction Workbook and Purdue's Assessment Tool/Watershed Inventory Making and making broad assumptions and generalizations, local NRCS staff and the Coordination Team estimated that by achieving Objective #6-3, the following pollutant load reductions would result:

Sediment Load Reduction: 1236 tons/yr.
Phosphorus Load Reduction: 1528 lbs/yr
Nitrogen Load Reduction: 2964 lbs/yr.

Additionally, reductions of direct load from manure are estimated to be 150 lbs/day for nitrogen and 121.87 lbs/day of phosphorus.

As the pollutant source (manure) is the same, simultaneous E coli reductions are anticipated to directly correspond with the nitrogen and phosphorous reductions.

6.2.4 Action Plan

In October of 2002, The Morgan County Soil and Water Conservation District

applied to the Indiana Department of Environmental Management for Section 319 Grant funds to help livestock owners voluntarily address water. The initial request was for "Early Stage 2 Implementation, which focuses primarily on Lambs Creek. The plan of action will be to first target those livestock owners whose animals have access to any waterway within the watershed. As funds become available, those livestock owners will be approached, educated about the impacts their animals may have on water quality, and offered the opportunity to participate in voluntary cost share program that will provide the following:

- Personnel to visit livestock facilities and discuss the many different available cost-share programs and provide technical assistance
- Exclusionary fencing from the stream(s)
- Alternative watering systems for animals that have been excluded from their water source.
- Vegetated buffer plantings where needed between the exclusionary fencing and the stream(s).

Actions Necessary to Achieve Objectives #6-1 and #6-2:
To achieve this objective, the Soil and Water Conservation District will utilize the grant funds mentioned above to:

Action 6-1
Hire contract personnel who will prioritize those areas where livestock have been identified and water quality is a concern, arrange visits to those properties, and offer technical and financial assistance to livestock producers regarding exclusionary fencing and other livestock best management practices

Action 6-2
Provide guidance to landowners and farmers regarding public and private conservation programs such as IDEM/EPA cost-share programs (Section 319), USDA cost-share programs (EQIP, CRP, etc.), etc.

- Organize and conduct livestock related field days, pasture walks and workshops

Actions Necessary to Achieve Objective #6-3:
Visit and interact with livestock producers who grant their livestock access to the streams and market the available cost-share dollars available to:

- Fence cattle from the streams
- Construct alternative water sources (nose pumps, gravity pumps, electric pumps, etc.)
- Develop buffer strips between pastureland and the stream

6.2.5 Resources
In accordance with assigned responsibilities and subject expertise, the Morgan County SWCD and NRCS staff members have been identified as the key resources to improve livestock practices within the Morgan County White River watershed. Together, these agencies will work together to educate landowners and livestock producers of the economic and environmental benefits of implementing conservation practices on pasture lands. These agencies will also be responsible for providing technical and financial assistance to landowners and producers to support the implementation of best management practices.

6.2.6 Legal Matters:
Legal matters do not apply to this section

6.3 MEASURING PROGRESS
Indicators of success will include a series of activities:

- Documenting, in GIS, the best management practices funded and implemented through USDA, IDNR, and IDEM cost-share funds
- Utilizing the IDEM's Load Reduction Workbook (where applicable) for best management practices implemented to estimate

sediment and nutrient load reductions
- Documenting the number of participants at agricultural field days and workshops.
- Documenting frequency and number of producers reached through outreach efforts.
- Conducting surveys among local farmers to assess their level of knowledge of and willingness to participate in conservation activities.

6.3.1 Monitoring Indicators

Indicators of success will include a series of activities:

- Documenting, in GIS, the implementation of best management practices funded and implemented through USDA, IDNR, and IDEM cost-share funds
- Utilizing the IDEM's Load Reduction Workbook (where applicable) for best management practices implemented to estimate sediment and nutrient load reductions
- Documenting the number of participants at agricultural field days and workshops.
- Documenting frequency and number of producers reached through outreach efforts.
- Conducting surveys among local farmers to assess their level of knowledge of and willingness to participate in conservation activities.

6.3.3 Operation and Maintenance

Ultimately the farmer or the landowner will be responsible for the operation and maintenance of any best management practices implemented with government dollars. The SWCD, NRCS, FSA, and IDEM require a 10-15 year maintenance agreement for practices installed with government dollars, depending upon the financial program utilized.

6.3.4 Re-Evaluation of Plan

The SWCD will be responsible for the re-evaluation of this plan. Such activities will occur on an annual basis to evaluate the progress and determine if any changes are necessary to the strategies originally devised.